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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,864	11/23/2004	Stephane Tisserand	RAN205R1	4758
7590		07/18/2006	EXAMINER	
Horst M Kasper		LEPISTO, RYAN A		
13 Forest Drive		ART UNIT		
Warren, NJ 07059		PAPER NUMBER		
		2883		

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/506,864

Applicant(s)

TISSERAND ET AL.

Examiner

Ryan Lepisto

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☒ Claim(s) 1-19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/1/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the foreign patent references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

### ***Specification***

2. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

4. The disclosure is objected to because of the following informalities: Appropriate labels like "Brief Description of the Drawings" and "Brief Summary of the Invention" are missing. The description of the drawings is missing references to Figures 3a, 3b, 3c, 4a, 4b, 4c, 4d, 5a, 5b, 5c and 5d. Appropriate correction is required.

### ***Drawings***

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: M. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

### ***Claim Objections***

6. **Claims 1-19** are objected to because of the following informalities:

- Claim 1 should begin with “An optical mode adapter...” and claims 2-19 should begin with either “An adapter...” or “The adapter” and “A method for making...”.
- The word “characterized” is misspelled in all claims.
- In claims 1-2, 8-9, 12 and 19: Each of these claims uses the word “that” to refer to either the refractive index or width of an object. “That” should be replaced with the appropriate – the refractive index – or – the width –. For example, in claim 1 the word “that” on the last line should be replaced with – the refractive index –.
- In claim 1: – the – should be added between “for” and “connection” on line 3, “is” should be replaced with – in – on line 5 after “characterized”, “being” should be replaced with – are – on line 5, -- and – should replace the comma after “(33)” on line 6.
- In claim 2: “higher” should be replaced with – larger – or – greater – or – wider –.
- In claim 3: The word “the” should be deleted on line 3 before “first (21)” and on line 5 before “first (11)” to assure proper antecedent basis.
- In claim 5: Replace “call 2” with – cell (2) – and the word “the” should be deleted on line 3 before “first (21)” and on line 5 before “first (11)” to assure proper antecedent basis.
- In claim 8: The word – refractive – should be added before “index” and the word “this” should be replaced with – the –.
- In claim 9: “it” should be replaced with “the adapter” and – refractive – should be added before “index”.
- In claim 12: – refractive – should be added before “index”.

- Claim 13 recites the limitation "the whole of the guide layers". There is insufficient antecedent basis for this limitation in the claim.
- In claims 15-19 the word "it" in the preamble of these claims should be replaced with – the method –.
- In claims 15-16 and 18: The word "the" before "M-shaped" should be replaced with – a – to assure proper antecedent basis.
- In claim 15: The period on line 4 should be deleted.
- In claim 16: "in" on line 8 should be replaced with – to – and "the" on line 9 before "depth" should be replaced with – a –.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claim 12** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim states that the refractive index of the guide is equivalent to the refractive index of the substrate multiplied by a factor higher than 1,001. It is not clear if this means that the refractive index of the guide is exactly 1,001 times the refractive index of the substrate or of the refractive index of the guide is equal to or greater than the refractive index of the substrate multiplied by 1,001.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-9 and 11-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Lee et al (US 6,631,225 B2)** (Lee) and **Takeuchi (US 5,910,012)**.

With regard to claims 1-9 and 11-13:

Lee teaches an optical mode adapter (Figs. 1-2, column 3 lines 24-55, column 4 lines 4-65) comprising a first lower refractive index channel (102) of SiON, a second higher refractive index channel (104) of Si<sub>3</sub>N<sub>4</sub> for connecting two waveguides at each end (column 4 lines 39-48), an adaptation cell (the area where the two channels are in contact having a length L<sub>3</sub>) and a guide layer (33) surrounding the channels. Lee further teaches that the first guide channel (102) has a width larger than the second guide channel (104) (Fig. 1), which tapers from a large width to a smaller width from left to right while the second channel tapers from larger width to a smaller width from left to right, both in the adaptation cell region (see Fig. 1) wherein the adaptation cell ends at one end where the first channel stops and at the other end where the second channel stops.

Lee does not teach expressly the mode adapter being formed on a substrate wherein the guide layer has a refractive index higher than the refractive index of the



substrate or a covering layer formed on the guide layer having a lower refractive index that the refractive index of the guide layer and channels or a guide layer with a thickness of between 1 and 20 microns.

Takeuchi teaches a mode adaptor for photodetecting (Figs. 5a-c and 6a-c) comprising a tapered and straight waveguide channels (part of 7a-c) formed on a substrate (1) having a guide layer (9) and a covering layer (12) formed on top wherein the guide layer is 1 micron thick (column 6 lines 24-26) and the guide layer has a refractive index higher than the refractive index of the substrate or a covering layer formed on the guide layer having a lower refractive index that the refractive index of the guide layer and channels (column 5 lines 44-68 and column 6 lines 14-39).

Lee and Takeuchi are analogous art because they are from the same field of endeavor, tapered waveguide mode couplers.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to form the structure taught by Lee on a substrate as taught by Takeuchi and use the materials taught by Takeuchi resulting the refractive index relationships taught by Takeuchi since Lee teaches that the mode adapter can be a flat edged taper like Takeuchi's (column 4 lines 60-65) and additions to form and detail without departing from the spirit of the invention are allowed (column 5 lines 1-3).

The motivation for doing so would have been to reduce parasitic resistance and to increase the speed of response characteristics by using the materials taught by Takeuchi (column 8 lines 6-10).

Note claim 12 is indefinite and therefore since the refractive index relationship of claim 1 is met, this claim limitation is met since it is indefinite and unclear unto the scope.

With regard to claim 14-19:

These limitations only add process limitations to the structure of claims 1 and 3 and therefore do not have any patentably distinct limitations over the Lee in combination of Takeuchi reference. Product claims are only defined by their structural limitations and not by the process of making such. Since claims 14-19 add no additional structure and the references meet the limitations of claim 1 and/or 3 the references will meet these limitations also.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted)

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., In re Garnero, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979).

9. **Claims 1 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lee and Nakamura (**US 6,253,003 B1**).

Lee teaches an optical mode adapter (Figs. 1-2, column 3 lines 24-55, column 4 lines 4-65) comprising a first lower refractive index channel (102) of SiON, a second higher refractive index channel (104) of Si<sub>3</sub>N<sub>4</sub> for connecting two waveguides at each end (column 4 lines 39-48), an adaptation cell (the area where the two channels are in contact having a length L<sub>3</sub>) and a guide layer (33) surrounding the channels. Lee further teaches that the first guide channel (102) has a width larger than the second guide channel (104) (Fig. 1), which tapers from a large width to a smaller width from left to right while the second channel tapers from larger width to a smaller width from left to right, both in the adaptation cell region (see Fig. 1) wherein the adaptation cell ends at one end where the first channel stops and at the other end where the second channel stops.

Lee does not teach expressly the mode adapter integrated in a substrate.

Nakamura teaches a mode adapter (Fig. 4) having two channels (1, 2) integrated in a substrate (3).

Lee and Nakamura are analogous art because they are from the same field of endeavor, tapered waveguide mode couplers.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to form the structure taught by Lee in a substrate as taught by Nakamura since Lee teaches that the mode adapter can be a flat edged taper like Nakamura's

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(column 4 lines 60-65) and additions to form and detail without departing from the spirit of the invention are allowed (column 5 lines 1-3).

The motivation for doing so would have been to optimize spot size (Nakamura column 3 lines 65-66) and to reduce coupling loss while keeping the device short in length (Nakamura column 4 lines 19-23).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Larsen (US 3,944,327), Doussiere (US 5,278,926), Kunkee et al (US 6,167,172), Forrest et al (US 6,330,378 B1), Cho et al (US 6,396,984 B1), Lee et al (US 6,697,551 B2), Yamada et al (US 2004/0057667 A1), Lee (US 6,870,987 B2), Block et al (US 2005/0123244 A1), Ghiron et al (US 7,013,067 B2).

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-Th 7:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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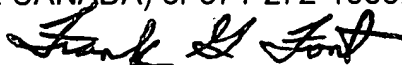
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Ryan Lepisto

Art Unit 2883

Date: 7/17/06



Frank Font

Supervisory Patent Examiner

Technology Center 2800